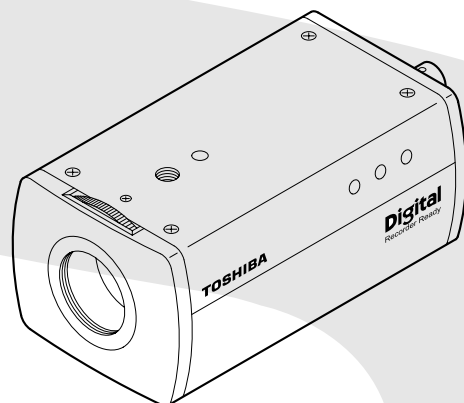


TOSHIBA

FILE NO. 210-200004

MANUAL



CCD CAMERA ***IK-528A***



IMPORTANT SAFEGUARDS

- 1. **Road Instructions**
All the safety and operating instructions should be read before the product is operated.
- 2. **Retain Instructions**
The safety instructions and instruction manual should be retained for future reference.
- 3. **Heed Warnings**
All warnings on the product and in the instruction manual should be adhered to.
- 4. **Follow Instructions**
All operating and use instructions should be followed.
- 5. **Cleaning**
Disconnect this video product from the power supply before cleaning.
- 6. **Attachments**
Do not use attachments not recommended by the video product manufacturer as they may cause hazards.
- 7. **Water and Moisture**
Do not use this video product near water-for example, near a bath tub, wash bowl, kitchen sink, or laundry tub, in a wet basement, or near a swimming pool and the like.
- 8. **Accessories**
Do not place this video product on an unstable cart, stand, tripod, bracket or table. The video product may fall, causing serious injury to a child or adult, and serious damage to the product. Use only with stand, tripod, bracket, or table recommended by the manufacturer, or sold with the video product. Any mounting of the product should follow the manufacturer's instructions, and should use a mounting accessory recommended by the manufacturer.
- 9. **Ventilation**
This video product should never be placed near or over a radiator or heat register. This video product should not be placed in a built-in installation such as a bookcase or rack unless proper ventilation is provided or the manufacturer's instructions have been adhered to.
- 10. **Power Sources**
This video product should be operated only from the type of power source indicated on the marking label. If you are not sure of the type of power supply to your location, consult your product dealer.
- 11. **Power-Cord Protection**
Power-Supply cords should be routed so that they are not likely to be walked on or pinched by items placed upon or against them, paying particular attention to cords at plugs, screws and the point where they exit from the product.

- 12. **Lightning**
For added protection for this video product during a lightning storm, or when it is left unattended and unused for long periods of time, unplug it from the wall outlet and disconnect the power supply and cable system. This will prevent damage to the video product due to lightning and power-line surges.
- 13. **Overloading**
Do not overload power supply and extension cords as this can result in a risk of fire or electric shock.
- 14. **Object and Liquid Entry**
Never push objects of any kind into this video product through openings as they may touch dangerous voltage points or short-out parts that could result in a fire or electrical shock. Never spill liquid of kind on the video product.
- 15. **Servicing**
Do not attempt to service this video product yourself as opening or removing covers may expose you to dangerous voltage or other hazards. Refer all servicing to qualified service personnel.
- 16. **Damage Requiring service**
Disconnect this video product from the power supply and refer servicing to qualified service personnel under the following conditions.
 - a. when the power-supply cord or plug is damaged.
 - b. If liquid has been spilled, or objects have fallen into the video product.
 - c. If the video product has been exposed to rain or water.
 - d. If the video product does not operate normally by following the operating instructions in the instruction manual. Adjust only those controls that are covered by the instruction manual as an improper adjustment of other controls may result in damage and will often require extensive work by a qualified technician to restore the video product to its normal operation.
 - e. If the video product has been dropped or the cabinet has been damaged.
 - f. When the video product exhibits a distinct change in performance-this indicates a need for service.
- 17. **Replacement Parts**
When replacement parts are required, be sure the service technician has used replacement parts specified by the manufacturer of have the same characteristics as the original part. Unauthorized substitutions may result in fire, electric shock or other hazards.
- 18. **Safety Check**
Upon completion of any service or repairs to this video product, ask the service technician to perform safety checks to determine that the video product is in proper operating condition.

	CAUTION	
RISK OF ELECTRIC SHOCK DO NOT OPEN		
CAUTION TO REDUCE THE RISK OF ELECTRIC SHOCK. DO NOT REMOVE COVER (OR BACK). NO USER SERVICEABLE PARTS INSIDE. REFER SERVICING TO QUALIFIED SERVICE PERSONNEL.		



The lightning flash with arrowhead symbol, within an equilateral triangle, is intended to alert the user to the presence of uninsulated "dangerous voltage" within the product's enclosure that may be of sufficient magnitude to constitute a risk of electric shock to persons.

The exclamation point within an equilateral triangle is intended to alert the user to the presence of important operating and maintenance (servicing) instructions in the literature accompanying the appliance.

- The CAUTION label, shown on the left, is attached on the bottom of camera.

WARNING :
TO REDUCE THE RISK OF FIRE OR ELECTRIC SHOCK, DO NOT EXPOSE THIS APPLIANCE TO RAIN OR MOISTURE.

- CAUTION
CONNECT 24V AC UL LISTED CLASS 2 POWER SUPPLY.

INFORMATION
This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

USER-INSTALLER CAUTION : Your authority to operate this FCC verified equipment could be voided if you make changes or modifications not expressly approved by the party responsible for compliance to Part 15 of the FCC rules.

1. FEATURES & DESCRIPTION :

This camera is a high resolution CCD MONOCHROME video camera designed for EIA system. With the adoption of a CCD, the camera produces an image with reduced lag, little geometric distortion and has good resistance to vibration and mechanical shock. With those features shown below, this series is suitable for surveillance application or as an input device for an image processing system.

(1) High resolution :

The camera can produce an image with horizontal resolution over 400 TV lines.

(2) High sensitivity :

With minimum illumination at 0.032 lux (F1.2, 3200K) ensures this unit can produce a good image even in very low light condition.

(3) Line-lock mode :

Based on this unique design, the image would be stable as viewed from a video monitor controlled by a switcher, so this unit is suitable for surveillance system application.

(4) Automatic electronic shutter (AES) :

The unit automatically adjusts shutter speed according to the subject brightness so that the amount of exposure is steady.

(5) 4-way programmable BLC show window type. Programmable Back Light Compensation gives Four user-selectable zone.

(6) Dynamic range boost increases Dynamic range by 40%.

(7) Easy back focus adjustment makes for easy installations.

2. CAUTIONS :

(1) In order to protect the camera, avoid placing or using it under direct sunlight, rain or dust. (Indoor use only.)

(2) Don't touch the CCD sensor directly with your fingers, If necessary, use soft cloth moistened with alcohol to wipe off the dust.

(3) When the camera is not in use, keep the lens or cap being attached to protect the CCD sensor.

(4) Connect AC 24V UL listed class 2 for power supply.

(5) Don't drop your camera or give it a strong shock or vibration, or it will incur malfunction.

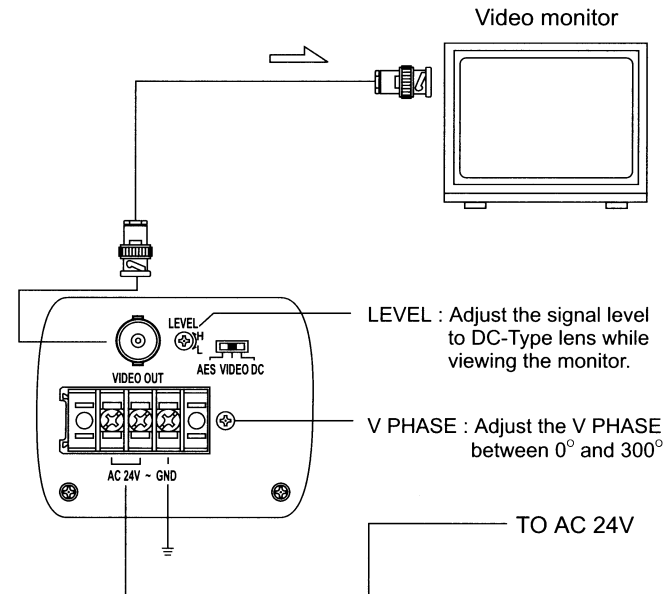
(6) Keep clean the video out connector and AC 24V input terminals.

3. SYSTEM COMPONENTS :

Camera	1
Instruction manual	1
Lens mount cap	1
IRIS 4 pins plug, E4-191J-100	1

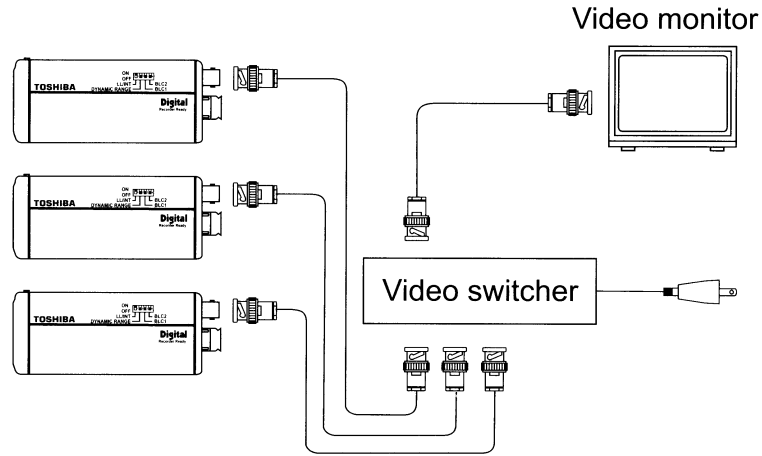
4. CONNECTION :

(1) When using one camera and one monitor :



Connect AC 24V UL listed class 2 for power supply

(2) when using several cameras and one monitor :



(3) When using the auto IRIS lens (with amplifier) :

- (a) Set the slide switch (on rear panel) to VIDEO position.
- (b) Connect the AI lens cable to the IRIS connector on left side of camera.

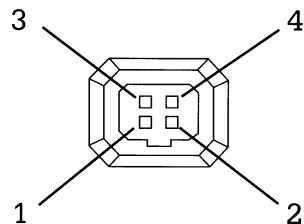
(4) When using the auto IRIS lens (without amplifier) :

- (a) Set the slide switch (on rear panel) to DC position.
- (b) Connect the auto IRIS lens cable to the IRIS connector on left side of camera.

NOTE : Please refer to the pin definitions and figure shown below to ensure correct operation.

IRIS pin definitions

	VIDEO	DC
1	+ 9V	DAMP - (y)
2	NC	damp + (r)
3	VIDEO	DRIVER + (wh)
4	GND	DRIVER - (g)



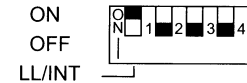
5. OPERATION PROCEDURE :

- (1) Before operation make sure the power source is correct for your camera.
- (2) Install lens to the camera.
- (3) Connect the VIDEO output to the Video monitor. The picture will appear on the monitor screen as the power is supplied to the camera.
- (4) Adjust the focus and aperture of the lens to get a best quality image.
- (5) Back focus adjustment :

In general, the back focus is calibrated in the factory. So readjustment is unnecessary. But depending on your application, back focus readjustment may be necessary. In this case, set the focus ring of the lens to the ∞ position and take a picture at a distance of 20m or more. Then, loosen the focus lock screw and turn the focus ring till the picture on the monitor is in focus. Now, tighten the focus lock screw .

(6) Line - Lock mode

When two or more cameras are switched by the video switcher for monitoring on a TV monitor, the picture may fluctuate due to different AC line phase of each camera. In this case, adjust the V PHASE (on rear panel) trimmer to get a stable picture. Show as below : (Default is Line - Lock)



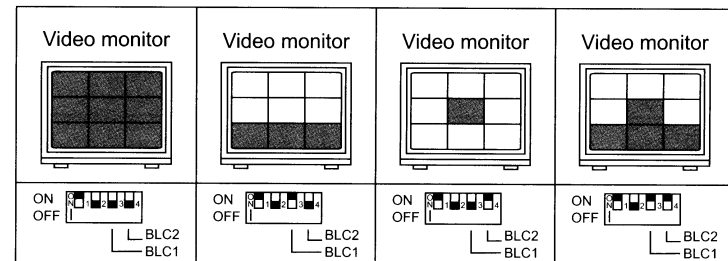
(7) Dynamic - Range Boost

It is change the video output from 115 IRE to 155 IRE when switch on. Show as below : (Default is off)

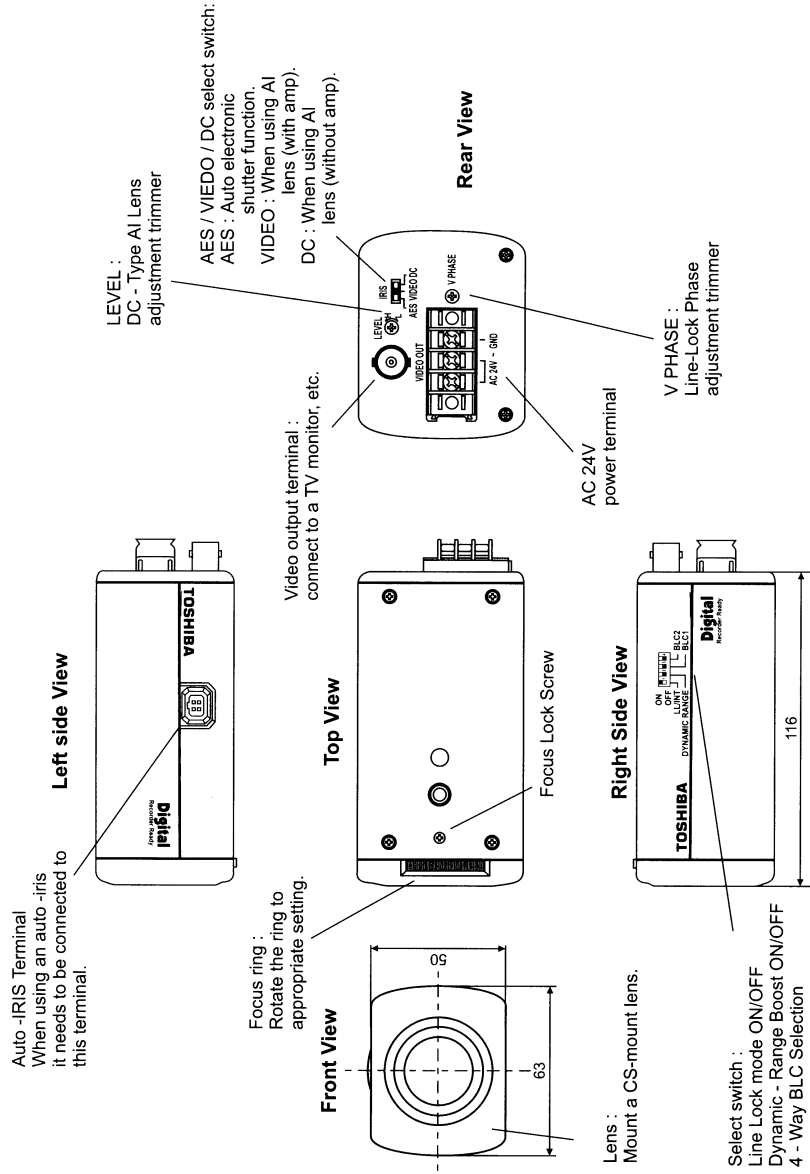


(8) BLC (BACK LIGHT COMPENSATION) Selection

When the automatic electronic iris and the auto iris lens used, the exposure adjustment is automatically performed so that a best picture is obtained at next monitor zone. There are 4 ways BLC fuction for different application the window area of BLC show as below:





6. PART NAMES & FUNCTIONS :



IMPORTANT SAFEGUARDS

- 1. **Road Instructions**
All the safety and operating instructions should be read before the product is operated.
- 2. **Retain Instructions**
The safety instructions and instruction manual should be retained for future reference.
- 3. **Heed Warnings**
All warnings on the product and in the instruction manual should be adhered to.
- 4. **Follow Instructions**
All operating and use instructions should be followed.
- 5. **Cleaning**
Disconnect this video product from the power supply before cleaning.
- 6. **Attachments**
Do not use attachments not recommended by the video product manufacturer as they may cause hazards.
- 7. **Water and Moisture**
Do not use this video product near water-for example, near a bath tub, wash bowl, kitchen sink, or laundry tub, in a wet basement, or near a swimming pool and the like.
- 8. **Accessories**
Do not place this video product on an unstable cart, stand, tripod, bracket or table. The video product may fall, causing serious injury to a child or adult, and serious damage to the product. Use only with stand, tripod, bracket, or table recommended by the manufacturer, or sold with the video product. Any mounting of the product should follow the manufacturer's instructions, and should use a mounting accessory recommended by the manufacturer.
- 9. **Ventilation**
This video product should never be placed near or over a radiator or heat register. This video product should not be placed in a built-in installation such as a bookcase or rack unless proper ventilation is provided or the manufacturer's instructions have been adhered to.
- 10. **Power Sources**
This video product should be operated only from the type of power source indicated on the marking label. If you are not sure of the type of power supply to your location, consult your product dealer.
- 11. **Power-Cord Protection**
Power-Supply cords should be routed so that they are not likely to be walked on or pinched by items placed upon or against them, paying particular attention to cords at plugs, screws and the point where they exit from the product.

- 12. **Lightning**
For added protection for this video product during a lightning storm, or when it is left unattended and unused for long periods of time, unplug it from the wall outlet and disconnect the power supply and cable system. This will prevent damage to the video product due to lightning and power-line surges.
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Do not overload power supply and extension cords as this can result in a risk of fire or electric shock.
- 14. **Object and Liquid Entry**
Never push objects of any kind into this video product through openings as they may touch dangerous voltage points or short-out parts that could result in a fire or electrical shock. Never spill liquid of kind on the video product.
- 15. **Servicing**
Do not attempt to service this video product yourself as opening or removing covers may expose you to dangerous voltage or other hazards. Refer all servicing to qualified service personnel.
- 16. **Damage Requiring service**
Disconnect this video product from the power supply and refer servicing to qualified service personnel under the following conditions.
 - a. when the power-supply cord or plug is damaged.
 - b. If liquid has been spilled, or objects have fallen into the video product.
 - c. If the video product has been exposed to rain or water.
 - d. If the video product does not operate normally by following the operating instructions in the instruction manual. Adjust only those controls that are covered by the instruction manual as an improper adjustment of other controls may result in damage and will often require extensive work by a qualified technician to restore the video product to its normal operation.
 - e. If the video product has been dropped or the cabinet has been damaged.
 - f. When the video product exhibits a distinct change in performance-this indicates a need for service.
- 17. **Replacement Parts**
When replacement parts are required, be sure the service technician has used replacement parts specified by the manufacturer of have the same characteristics as the original part. Unauthorized substitutions may result in fire, electric shock or other hazards.
- 18. **Safety Check**
Upon completion of any service or repairs to this video product, ask the service technician to perform safety checks to determine that the video product is in proper operating condition.

	CAUTION RISK OF ELECTRIC SHOCK DO NOT OPEN	
CAUTION TO REDUCE THE RISK OF ELECTRIC SHOCK. DO NOT REMOVE COVER (OR BACK). NO USER SERVICEABLE PARTS INSIDE. REFER SERVICING TO QUALIFIED SERVICE PERSONNEL.		

- The CAUTION label, shown on the left, is attached on the bottom of camera.



The lightning flash with arrowhead symbol, within an equilateral triangle, is intended to alert the user to the presence of uninsulated "dangerous voltage" within the product's enclosure that may be of sufficient magnitude to constitute a risk of electric shock to persons.

WARNING :
TO REDUCE THE RISK OF FIRE OR ELECTRIC SHOCK, DO NOT EXPOSE THIS APPLIANCE TO RAIN OR MOISTURE.



The exclamation point within an equilateral triangle is intended to alert the user to the presence of important operating and maintenance (servicing) instructions in the literature accompanying the appliance.

• **CAUTION**
CONNECT 24V AC UL LISTED CLASS 2 POWER SUPPLY.

FIELD INSTALLATION MARKING :
WORDED : "THIS INSTALLATION SHOULD BE MADE BY A QUALIFIED SERVICE PERSON AND SHOULD CONFORM TO ALL LOCAL CODES."

INFORMATION
This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

USER-INSTALLER CAUTION : Your authority to operate this FCC verified equipment could be voided if you make changes or modifications not expressly approved by the party

1. FEATURES & DESCRIPTION :

This camera is a high resolution CCD MONOCHROME video camera designed for EIA system. With the adoption of a CCD, the camera produces an image with reduced lag, little geometric distortion and has good resistance to vibration and mechanical shock. With those features shown below, this series is suitable for surveillance application or as an input device for an image processing system.

(1) High resolution :

The camera can produce an image with horizontal resolution over 570 TV lines.

(2) High sensitivity :

With minimum illumination at 0.015 lux (F1.2, 3200K, AGC WIDE) ensures this unit can produce a good image even in very low light condition.

(3) Since the camera uses AC 24V ~/DC12 V , it can be installed and built into system easily.

(4) Line-lock mode :

Based on this unique design, the image would be stable as viewed from a video monitor controlled by a switcher, so this unit is suitable for surveillance system application.

(5) Automatic electronic shutter (AES) :

The unit automatically adjusts shutter speed according to the subject brightness so that the amount of exposure is steady.

(6) 4-way programmable BLC show window type. Programmable Back Light Compensation gives Four user-selectable zone.

(7) Dynamic range boost increases Dynamic range by 40%.

(8) Easy back focus adjustment and Menu-Driven set-up makes for easy installations.

2. CAUTIONS :

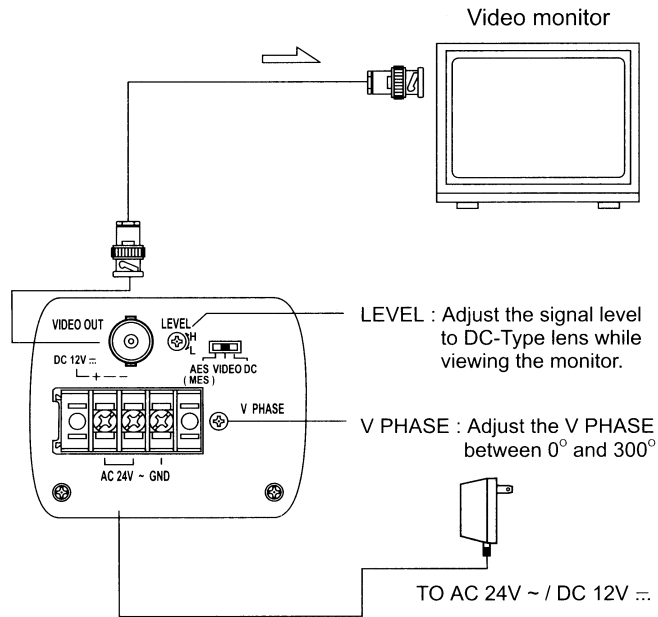
- (1) In order to protect the camera, avoid placing or using it under direct sunlight, rain or dust. (Indoor use only.)
- (2) Don't touch the CCD sensor directly with your fingers, If necessary, use soft cloth moistened with alcohol to wipe off the dust.
- (3) When the camera is not in use, keep the lens or cap being attached to protect the CCD sensor.
- (4) Connect AC 24V UL listed class 2 or DC 12V for power supply. Never input AC 24V and DC 12V at the same time.
- (5) Don't drop your camera or give it a strong shock or vibration, or it will incur malfunction.
- (6) Keep clean the video out connector and Power input terminals.

3. SYSTEM COMPONENTS :

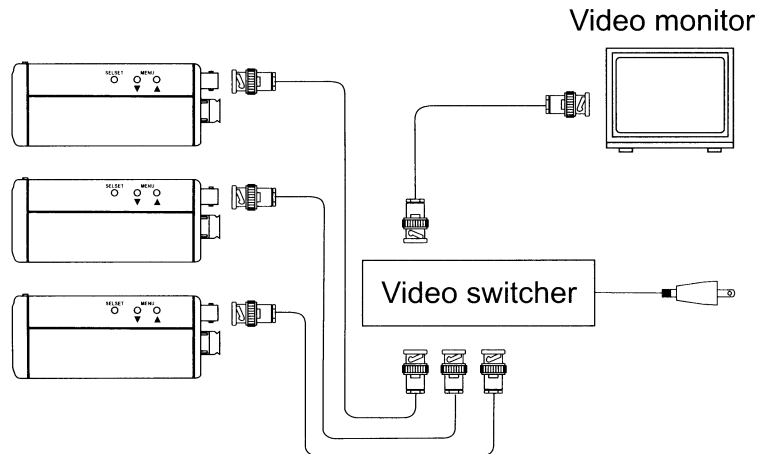
Camera	1
Instruction manual	1
Lens mount cap	1
IRIS 4 pins plug, E4-191J-100	1

4. CONNECTION :

(1) When using one camera and one monitor :



(2) when using several cameras and one monitor :



(3) When using the auto IRIS lens (with amplifier) :

(a) Set the slide switch (on rear panel) to VIDEO position.

(b) Connect the AI lens cable to the IRIS connector on left side of camera.

(4) When using the auto IRIS lens (without amplifier) :

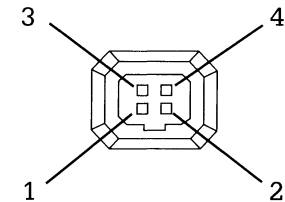
(a) Set the slide switch (on rear panel) to DC position.

(b) Connect the auto IRIS lens cable to the IRIS connector on left side of camera.

NOTE : Please refer to the pin definitions and figure shown below to ensure correct operation.

IRIS pin definitions

	VIDEO	DC
1	+ 12V	DAMP - (y)
2	NC	damp + (r)
3	VIDEO	DRIVER + (wh)
4	GND	DRIVER - (g)



5. OPERATION PROCEDURE :

(1) Before operation make sure the power source is correct for your camera.

(2) Install lens to the camera.

(3) Connect the VIDEO output to the Video monitor. The picture will appear on the monitor screen as the power is supplied to the camera.

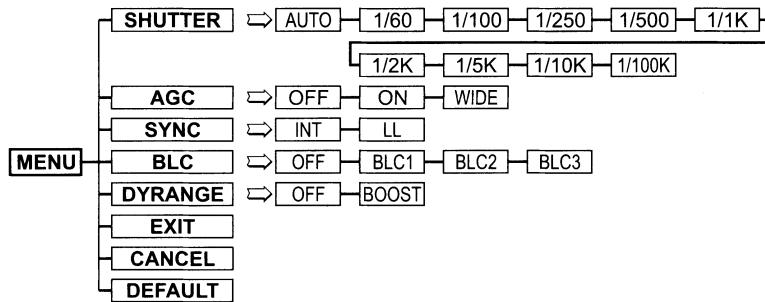
(4) Adjust the focus and aperture of the lens to get a best quality image.

(5) Back focus adjustment :

In general, the back focus is calibrated in the factory. So readjustment is unnecessary. But depending on your application, back focus readjustment may be necessary. In this case, set the focus ring of the lens to the ∞ position and take a picture at a distance of 20m or more. Then, loosen the focus lock screw and turn the focus ring till the picture on the monitor is in focus. Now tighten the focus lock screw.

5-1. Menu-Driven set-up

The setting menus of hierarchy are shown below and with on-screen character displays.



5-2. Setting switches and the functions

On the side panel of the camera there are three push button switches as shown below :

Switch name	Main function
SELECT	Setting mode call on / off, setting entry
▼	Setting item selection (down)
▲	Setting item selection (up)

5-3. Setting mode call and basics

Press the SELECT switch down about 2 seconds then menu will appear on the display.

```

SHUTTER  AUTO
AGC       ON
SYNC     LL
BLC      OFF
DYRANGE  OFF
EXIT CANCEL DEFAULT
  
```

5-3-1. Shutter (Exposure time)

Set the slide switch (on rear panel) to AES / (MES) position. Move the cursor to the position as shown in Fig. Using the SELECT switches, choose the shutter speed from AUTO through 1/100K

```

SHUTTER  AUTO
AGC       ON
SYNC     LL
BLC      OFF
DYRANGE  OFF
EXIT CANCEL DEFAULT
  
```

AUTO (AES)

1/60, 1/100, 1/250, 1/500, 1/1K, 1/2K, 1/5K, 1/10K, 1/100K (MES)

When the rear panel switch is turned to VIDEO or DC, the exposure time is fixed 1/60 sec, and shutter mode turn to IRIS.

5-3-2. AGC

Move the cursor to the position shown in Fig. Using SELECT switches, to select ON, WIDE, OFF

- A. ON (Standard position, max gain = 18dB)
- B. WIDE (High-Sensitivity position, max gain = 32dB)
- C. OFF

```

SHUTTER  AUTO
AGC       ON
SYNC     LL
BLC      OFF
DYRANGE  OFF
EXIT CANCEL DEFAULT
  
```

5-3-3. SYNC

Move the cursor to the position shown in Fig. Using the SELECT switches, to select INT or LL in the SYNC item.

- A. INT : The camera is in the internal SYNC mode.
- B. LL : The camera is in the Line-Lock Mode. Setting 0 to 300 degree by adjusting the V phase of rear panel.

```

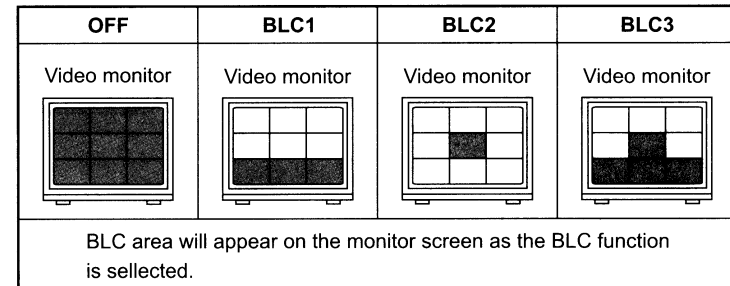
SHUTTER  AUTO
AGC       ON
SYNC     LL
BLC      OFF
DYRANGE  OFF
EXIT CANCEL DEFAULT
  
```

5-3-4. BLC (BACK LIGHT COMPENSATION)

Move the cursor to the position shown in Fig. Using the SELECT switches, select the OFF, BLC1, BLC2, BLC3. When the automatic electronic iris and the auto iris lens used the exposure adjustment is automatically performed so that a best picture is obtained at next monitor zone. There are 4 ways BLC function for different application. The window area of BLC show as below:

```

SHUTTER  AUTO
AGC       ON
SYNC     LL
BLC      OFF
DYRANGE  OFF
EXIT CANCEL DEFAULT
  
```



5-3-5. DYRANGE (Dynamic - Range Boost)

Move the cursor to the position in Fig. Using the SELECT switches, SELECT the OFF, BOOST. It is changed the video output from 115 IRE to 155 IRE.

- A. OFF (Standard position, max 115 IRE)
- B. Boost (High dynamic range position, Max 155 IRE)

SHUTTER	AUTO
AGC	ON
SYNC	LL
BLC	OFF
DYRANGE	OFF
EXIT CANCEL DEFAULT	

5-3-6. EXIT

Move the cursor to the position in Fig. Press the SELECT switch when save all settings and exit.

SHUTTER	AUTO
AGC	ON
SYNC	LL
BLC	OFF
DYRANGE	OFF
EXIT CANCEL DEFAULT	

5-3-7. CANCEL

Move the cursor to the position in Fig. Press the SELECT switch, exit menu immediately and don't save.

SHUTTER	AUTO
AGC	ON
SYNC	LL
BLC	OFF
DYRANGE	OFF
EXIT CANCEL DEFAULT	

5-3-8. DEFAULT

Move cursor to the position in Fig. Press the SELECT switch to recall the factory settings.

Default position is below :

SHUTTER	AUTO / IRIS
AGC	ON
SYNC	LL
BLC	OFF
DYRANGE	OFF

SHUTTER	AUTO
AGC	ON
SYNC	LL
BLC	OFF
DYRANGE	OFF
EXIT CANCEL DEFAULT	

6. PART NAMES & FUNCTIONS :

